

CLAIMS

1. A method of handoff control for a wireless remote unit having an established communications link with a first base station, comprising the steps of:
- transmitting a message to a network controller identifying a second base station having signal strength sufficient to establish communication;
 - receiving a message from said network controller via said first base station identifying said second base station as a selected base station;
 - monitoring an overhead channel from said second base station in order to determine a frame synchronization of said second base station; and
 - transmitting said frame synchronization to said network controller.
2. The method of Claim 1, further comprising the step of receiving a message from said network controller via said first base station identifying said second base station as an active base station.
3. The method of Claim 1, wherein said first base station and said second base station are asynchronous with respect to one another.
4. The method of Claim 1, further comprising the step of diversity combining signals transmitted by said first and said second base stations.
5. The method of Claim 1, further comprising the step of receiving a message from said network controller via said first base station comprising a neighbor list from which said second base station is selected.
6. The method of Claim 5 wherein said neighbor list comprises a series of entries, each entry corresponding to a base station with a high probability of having signal strength sufficient to establish communication, said entries comprising information identifying a reference base station and a PN offset wherein a timing of said reference base station is used as a reference timing for said PN offset.

7. The method of Claim 6, wherein said entries further comprise a
2 window size over which a search should be performed.

8. The method of Claim 7, wherein said window size implicitly carries
2 information concerning a relative class of synchronization between said
reference base station and said base station to which said entries correspond.

9. The method of Claim 7, wherein said window size carries information
2 concerning whether said base station corresponding to said entry is frame
synchronized with said reference base station.

10. A handoff control apparatus in a wireless remote unit, said remote
2 unit having an established communication link with a first base station, said
apparatus comprising:

4 means for transmitting a message to a network controller identifying a
second base station having signal strength sufficient to establish communication;

6 means for receiving a message from said network controller via said first
base station identifying said second base station as a selected base station;

8 means for monitoring an overhead channel from said second base
station in order to determine a frame synchronization of said second base
10 station; and

means for transmitting said frame synchronization to said network
12 controller.

11. A method of handoff control for a wireless remote unit having an
2 established communications link with a first base station, comprising the steps
of:

4 receiving a message from said remote unit identifying a second base
station having signal strength sufficient to establish communication;

6 transmitting a message to said remote unit via said first base station
identifying said second base station as a selected base station;

8 receiving a message identifying a frame synchronization of said second
base station; and

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10 establishing communication with said remote unit via said second base
station such that transmissions from said first base station and transmissions
12 from said second base station arrive at said remote unit approximately
synchronized.

12. The method of Claim 11, further comprising the step of transmitting
2 a message to said remote unit via said first base station identifying said second
base station as an active base station.

13. The method of Claim 11, wherein said first base station and said
2 second base station are asynchronous with respect to one another.

14. The method of Claim 11, further comprising the step of diversity
2 combining signals received from said remote unit via said first and said second
base stations.

15. The method of Claim 11, wherein said step of transmitting a
2 message identifying said second base station as a selected base station is
executed only if resources are available at said second base station to support
4 communication with said remote unit.

16. A wireless remote unit having an established communications link
2 with a first base station, comprising:

means for receiving a message from said remote unit identifying a
4 second base station having signal strength sufficient to establish communication;

means for transmitting a message to said remote unit via said first base
6 station identifying said second base station as a selected base station;

means for receiving a message identifying a frame synchronization of
8 said second base station; and

means for establishing communication with said remote unit via said
10 second base station such that transmissions from said first base station and
transmissions from said second base station arrive at said remote unit
12 approximately synchronized.

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17. In a communication system in which a remote unit communicates
2 with other users via at least one base station, and in which each of at least two
or more base stations among a plurality of base stations within said system
4 transmits a unique pilot signal, a remote unit transceiver comprising:

6 a pilot signal measurement circuit which measures strength of
pilot signals received from a set of neighboring base stations;

8 a controller which generates a first signal strength message when
a measured pilot signal of a target base station from among said set of
neighboring base stations exceeds a first predetermined level;

10 a remote unit transmitter which transmits said first signal strength
message to at least one base station with which said remote unit is
12 currently communicating, said first signal strength message identifying
said target base station; and

14 a demodulator which receives a first direction signal from said at
least one base station and, in response to said first direction signal,
16 monitors a forward link transmission from said target base station to
determine a frame synchronization of said target base station.

18. The remote unit transceiver of Claim 17 wherein said controller
2 generates a relative frame synchronization message to convey said frame
synchronization and said remote unit transmitter transmits said relative frame
4 synchronization to said at least one base station.

19. In a spread spectrum communication system having a plurality of
2 base stations and in which a remote unit communicates with another system
user via at least one base station, a method for directing communications
4 between said remote unit and said base stations comprising the steps of:

6 providing to said remote unit an active list identifying one or more
base stations through which active communication is established;

8 receiving from said remote unit a candidate list identifying at least
one target base station;

10 determining an availability of system resources at said target base
station;

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12 providing to said remote unit a selected list identifying said target
base station;
14 receiving from said remote unit an alignment message identifying
synchronization information concerning said target base station;
16 directing said target base station to establish communication with
said remote unit in accordance with said synchronization information;
and
18 providing to said remote unit a second active list identifying said
target base station.

20. The method of Claim 19, wherein said selected list comprises just
2 one entry.

21. The method of directing communications of Claim 19, further
2 comprising the steps of providing to said remote unit a neighbor list comprising
a series of entries, said entries comprising information identifying a reference
4 base station and a PN offset wherein a timing of said reference base station is
used as a reference timing for said PN offset.

22. The method of directing communications of Claim 21, wherein said
2 entries further comprise a window size over which a search should be
performed.

23. The method of directing communications of Claim 22, wherein said
2 window size implicitly carries information concerning a relative class of
synchronization between said reference base station and said base station to
4 which said entries correspond.

24. The method of directing communications of Claim 22, wherein said
2 window size carries information concerning whether said base station
corresponding to said entry is frame synchronized with said reference base
4 station.

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25. A network controller in spread spectrum communication system in
2 which a remote unit communicates with another system user via at least one
base station and wherein each base station transmits an identifying pilot signal,
4 said network controller comprising:

means for providing to said remote unit an active list identifying
6 one or more base stations through which active communication is
established;

8 means for receiving from said remote unit a candidate list
identifying at least one target base station;

10 means for determining an availability of system resources at said
target base station;

12 means for providing to said remote unit a selected list identifying
said target base station;

14 means for receiving from said remote unit an alignment message
identifying synchronization information concerning said target base
16 station;

means for directing said target base station to establish
18 communication with said remote unit in accordance with said
synchronization information; and

20 means for providing to said remote unit a second active list
identifying said target base station.

26. A method of time alignment in a wireless communications system in
2 which a remote unit is capable of communication with one or more base
stations simultaneously, said method comprising the steps of:

4 receiving a first forward link transmission from a first base station
having a first frame alignment;

6 receiving a second forward link transmission from a second base
station having a second frame alignment wherein said second frame
8 alignment comprises information concerning frame boundaries and
excludes information concerning an absolute frame number;

10 selecting a first arbitrary frame alignment;

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combining said first forward link transmission and said second
forward link transmission according to said first arbitrary frame alignment
creating a combined signal;
determining whether a performance indication of said combined
signal is within expected limits; and
combining said first forward link transmission and said second
forward link transmission using a second arbitrary frame alignment if said
performance indication is not within the expected limits.

27. A method of time alignment in a wireless communications system in
which a remote unit is capable of communication with one or more base
stations simultaneously, said method comprising the steps of:
receiving a first forward link transmission from a first base station
having a first frame alignment;
receiving a second forward link transmission from a second base
station having a second frame alignment wherein said second frame
alignment comprises information concerning frame boundaries and
excludes information concerning an absolute frame number;
combining said first forward link transmission and said second
forward link transmission according to a first frame alignment hypothesis
to determine a first performance indication;
combining said first forward link transmission and said second
forward link transmission according to a second frame alignment
hypothesis to determine a second performance indication; and
comparing said first and second performance indications in order
to determine a most likely absolute frame alignment.

28. An apparatus for time alignment in a wireless communications
remote unit capable of communication with one or more base stations
simultaneously, said apparatus comprising:
means for receiving a first forward link transmission from a first
base station having a first frame alignment;
means for receiving a second forward link transmission from a
second base station having a second frame alignment wherein said

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8 second frame alignment comprises information concerning frame
boundaries and excludes information concerning an absolute frame
10 number;

means for selecting a first arbitrary frame alignment;

12 means for combining said first forward link transmission and said
second forward link transmission according to said first arbitrary frame
14 alignment;

means for determining whether a performance indication is within
16 expected limits; and

means for combining said first forward link transmission and said
18 second forward link transmission using a second arbitrary frame
alignment if said performance indication is not within the expected limits.

29. An apparatus for time alignment in a wireless communications
2 system in which a remote unit is capable of communication with one or more
base stations simultaneously, said apparatus comprising:

4 means for receiving a first forward link transmission from a first
base station having a first frame alignment;

6 means for receiving a second forward link transmission from a
second base station having a second frame alignment wherein said
8 second frame alignment comprises information concerning frame
boundaries and excludes information concerning an absolute frame
10 number;

means for combining said first forward link transmission and said
12 second forward link transmission according to a first frame alignment
hypothesis to determine a first performance indication;

14 means for combining said first forward link transmission and said
second forward link transmission according to a second frame alignment
16 hypothesis to determine a second performance indication; and

means for comparing said first and second performance
18 indications in order to determine a most likely absolute frame alignment.

30. In a spread spectrum communication system in which a remote unit
2 communicates with another system user via at least one base station, a method

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for directing communications between said remote unit and said base stations
4 comprising the steps of:

providing to said remote unit a neighbor list identifying one or
6 more base stations;

providing to said remote unit an active list identifying one or more
8 base stations through which active communication is established;

receiving from said remote unit a candidate list identifying at least
10 one target base station;

determining an availability of system resources at said at least
12 one target base station; and

providing to said remote unit an active list identifying said at least
14 one target base station;

wherein said neighbor list comprises a series of entries, said
16 entries comprising information identifying a reference base station and a
PN offset wherein a timing of said reference base station is used as a
18 reference timing for said PN offset.

31. The method of Claim 30, wherein said entries further comprise a
2 window size over which a search should be performed.

32. The method of Claim 31, wherein said window size implicitly carries
2 information concerning a relative class of synchronization between said
reference base station and said base station to which said entries correspond.

33. The method of Claim 31, wherein said window size carries
2 information concerning whether said base station corresponding to said entry is
frame synchronized with said reference base station.

34. In a spread spectrum communication system in which a remote unit
2 communicates with another system user via at least one base station, an
apparatus for directing communications between said remote unit and said
4 base stations comprising:

means for providing to said remote unit a neighbor list identifying
6 one or more base stations;

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means for providing to said remote unit an active list identifying one or more base stations through which active communication is established;

means for receiving from said remote unit a candidate list identifying at least one target base station;

means for determining an availability of system resources at said at least one target base station; and

means for providing to said remote unit an active list identifying said at least one target base station;

wherein said neighbor list comprises a series of entries, said entries comprising information identifying a reference base station and a PN offset wherein a timing of said reference base station is used as a reference timing for said PN offset.

35. In a spread spectrum communication system in which a remote unit communicates with another system user via at least one base station, a method for directing communications between said remote unit and said base stations comprising the steps of:

receiving at said remote unit an active list identifying one or more base stations through which active communication is established;

receiving at said remote unit a neighbor list identifying one or more base stations;

measuring at said remote unit a signal strength of a pilot signal transmitted by each base station having an entry on said neighbor list;

transmitting a first message from said remote unit, said first message identifying a candidate list comprising an entry corresponding to at least one target base station; and

receiving at said remote a new active list of base station comprising an entry corresponding to said at least one target base station;

wherein said neighbor list comprises a series of entries, said entries comprising information identifying a reference base station and a PN offset wherein a timing of said reference base station is used as a reference timing for said PN offset.

36. The method of Claim 35, wherein said entries further comprise a
2 window size over which a search should be performed.

37. The method of Claim 36, wherein said window size implicitly carries
2 information concerning a relative class of synchronization between said
reference base station and said base station to which said entries correspond.

38. The method of Claim 36, wherein said window size carries
2 information concerning whether said base station corresponding to said entry is
frame synchronized with said reference base station.

39. In a spread spectrum communication system in which a remote unit
2 communicates with another system user via at least one base station, an
apparatus for directing communications between said remote unit and said
4 base stations comprising:

means for receiving at said remote unit an active list identifying
6 one or more base stations through which active communication is
established;

8 means for receiving at said remote unit a neighbor list identifying
one or more base stations with a high probability of having signal strength
10 sufficient to establish communication;

means for measuring at said remote unit a signal strength of a
12 pilot signal transmitted by each base station having an entry on said
neighbor list;

14 means for transmitting a first message from said remote unit, said
first message identifying a candidate list comprising an entry
16 corresponding to at least one target base station; and

means for receiving at said remote a new active list of base
18 station comprising an entry corresponding to said at least one target
base station;

20 wherein said neighbor list comprises a series of entries, said
entries comprising information identifying a reference base station and a

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- 22 PN offset wherein a timing of said reference base station is used as a reference timing for said PN offset.

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